Effect of Implementing a Health Education Program on Self-Management Practices and Quality of Life among Patients with Epilepsy

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Abstract

Background: Patients with epilepsy and their families require general and specialized health education about the condition to enable them to make decisions to minimize the impact of epilepsy on their lives. The provision of good quality, relevant education about the condition is one of the most important roles that the nurse should undertake. This work **aimed** to determine the effect of health education program on self-management practices and quality of life in patients with epilepsy. **Method:** This quasi-experimental design was carried out on 80 patients aged from 20 to 60 years old, diagnosed with epilepsy for at least one year. Patients were divided into two equal groups. The study group subjected to the designed health education program in addition to the routine hospital care. The control group received the routine epilepsy care offered by their clinic, which is brief history taking, prescribing of antiepileptic drugs, and asking laboratory investigations as needed. **Results:** There was a highly statistically significant positive correlation between the mean percent score of knowledge and epilepsy self-management practices and quality of life in epilepsy inventory (QOLIE) overall score among the study group one month and three months post implementation of the health education program. There was a highly statistically significant positive correlation between the mean percent score of epilepsy self-management practices and QOLIE overall score among the study group at one month and three months after the health education program. **Conclusion:** Adult patients with epilepsy who receive health education exhibit higher knowledge, self-management practices and mean scores than those patients who did not receive.

Keywords: Epilepsy, Health Education Program, Self-management Practices, Quality of Life in Epilepsy Inventory

Introduction

Epilepsy is a huge health problem affecting about more than 69 million people worldwide. The prevalence and incidence of epilepsy vary among the countries. The overall prevalence of epilepsy is 10 per 1000 persons **(Jost et al., 2016)**. According to the World Bank Income classification, nearly 90 % of people with epilepsy (PWE) belong to low and middle-income countries. Men tend to be affected slightly more than women. Egypt is characterized by a relatively high incidence and prevalence of epilepsy. In Egypt, the prevalence rate is 9.3/1000 persons and the incidence rate is 1.5/1000 persons **(Jost et al., 2018)**.

Self-management strategies related to seizure control for adults living with epilepsy can produce significant gains in overall well-being and condition adaptation. Furthermore, they are likely to experience a good health perception and a sense of mastery over their condition **(Taylor et al., 2011)**. Education modules should have a special focus on helping PWE gain a better understanding of their condition and improving capabilities in self-management. Moreover, receiving specific epilepsy self-management education leads to improvements in quality of life (QOL) and well-being **(Edward et al., 2019)**.

Epilepsy is a devastating disorder that affects patients' QOL **(Nabukenya et al., 2014)**. The World Health Organization (WHO) has defined QOL as "an individual's perception of their position in life in the context of the culture and value systems in which they live and about their goals, expectations, standards and concerns". PWE have lower QOL compared with healthy persons **(Gholami et al., 2016)**.They are prone to have poorer self-esteem, and higher levels of anxiety, and depression. They are more likely to be underemployed or unemployed with lower marriage rates and greater social isolation **(Shetty et al., 2011)**.

Proper management of chronic health conditions leads to better health outcomes, improved QOL, and realignment of healthcare expenditure, including decreased demand for health services **(Aliasgharpour et al., 2013)**. Nurses play a pivotal role in the management of PWE. The role of the nurse in epilepsy encompasses a range of activities and is not limited to managing patients during seizures. Nurses should take an integral part in the network of care of PWE. The key roles of nurses are to support epilepsy specialists to ensure access to community and multi-agency services and to provide information, training, and support to PWE, families, and carers. The provision of good quality relevant education about the condition is one of the most important roles that the nurse should undertake. PWE requires general and specialized information about the condition to enable them to make decisions to minimize the impact of epilepsy on their lives **(Mestecky A, 2011)**.

Obtaining requisite knowledge and skills related to epilepsy and its management can also promote optimal well-being and QOL for PWE and their families **(Institute of Medicine Committee on the Public Health Dimensions of the, 2012)**. This work aimed to determine the effect of implementing a health education program on self-management practices and QOL among adult patients with epilepsy.

Materials And Method:

Subjects

This quasi-experimental design study was carried out on 80 patients aged from 20 to 60 years old, with clinical criteria of a diagnosis of epilepsy for at least one year, able to communicate verbally, receiving antiepileptic drugs as a standard treatment for epilepsy, with stable clinical condition at the time of assessment, free from psychotic disorders, or any other chronic diseases, not scheduled for brain surgery.

Sample size calculation:

Epi- info-7 program **(Dean et al., 2000)**, was used to estimate the minimum sample size using " n= z2p (1-p) /d2 ". The sample size calculated by the following criteria: Expected frequency =50%, acceptable error = 10%, confidence coefficient = 95%, the minimal sample size was estimated as 78 patients.

The study was done after approval from the Ethical Committee Alexandria University Hospitals, Faculty of Nursing, Egypt. An informed written consent was obtained from the patients. Patients were divided into two equal groups: The study group:

subjected to the designed health education program in addition to the routine hospital care. The control group: received the routine epilepsy care offered by their clinic, which is, brief history taking, prescribing of AEDs, and asking laboratory investigations and/or diagnostic studies as needed.

Tools of the study:
1. **Epilepsy Patient's Knowledge Structured Interview Schedule**

It used to assess patients ' knowledge in relation to epilepsy. It was divided into two parts: Part A- Socio-demographic data; age, sex, residence area, marital status, level of education, occupation, adequacy of monthly income from the patient's point of view, carers of the patient at home, and the carers ' level of education. Part B- Patients' clinical data; age at first seizure (Years), duration of illness, family history of epilepsy, presence of aura and its description, type of seizure, duration of seizure, seizure triggers, seizure frequency in the last month, and the prescribed medications. Part II: Composed of eight questions with fixed alternatives about epilepsy in relation to: Meaning of epilepsy, causes of epilepsy, seizure triggers, symptoms that immediately precede the occurrence of seizure (Auras), signs and symptoms related to epilepsy, problems and complications of epilepsy, risks should be avoided to prevent hazards during seizure attacks, antiepileptic drugs' side effects. The patients were scored on a 3-point scale; a score of 2 for correct and complete answer while 1 score for correct and incomplete answer, while 0 score for wrong answer or don't know. The total knowledge scores ranged from 0 to 16 points. Score < 50% = poor, between 50≤75% = fair, ≥ 75% =good knowledge level.

2. **Epilepsy Self-Management Scale**

It is settled to assess what people do to manage their epilepsy, and frequency of using epilepsy self-management practices. This tool was adapted and translated into Arabic language. For this translated Arabic version content validity was assessed, and reliability ranged from 0.81-0.86. It comprises 38 items in the form of statements divided into 26 original items and 12 negatively reversed worded items. Each item is rated on a 5-point scale ranging from 1= never, to 5= always. The scale was categorized into **five subscales:**

a. Information management (IM): Includes 8 items used to assess keeping seizure frequency diary (1), calling physician in case of antiepileptic drug side effects (3), keeping record of experienced types of seizures (5), keeping track of any experienced side effects (7), carrying information stating having epilepsy (20), social support and socialization (35,37,38).
b. Lifestyle management (LM): Includes 6 items used to assess stress management (2, 14), personal hygiene, especially mouth care (18), sleep (13), exercise (22), and diet (33).
c. Medication management (MM): Includes 10 items used to assess antiepileptic drug compliance (9, 16, 28), avoiding skipping doses due to medications side effects (25), follow up (24), handling medication running out (4, 8) and antiepileptic drug refill (21, 27).
d. Safety management (SM): Includes 8 items to assess staying out late at night (6), swimming precautions (17), using power tools (23), bathing safety (26, 29), medication safety (31), climbing objects (34) , and drinking a lot of coffee and cigarettes smoking(36).
e. Seizure management (SeM): Includes 6 items used to assess seizure control practices such as avoiding seizure triggers; (10, and 32), keeping seizure medication when going away from home (11), reporting doctor about having more seizures than usual (12), having ways of reminding the self to take seizure medication (15), doing blood tests as the doctor orders (19). Each of the 38 items was rated on a 5-point Likert scale from ''never'' (1), ''rarely'' (2), ''sometimes'' (3), ''Most of the time'' (4), to ''always'' (5). Total scores were found by reverse coding: the 12 negatively worded items and summing responses to the 26 original positive items. Total scores of all 38 items ranged from 38-190 with higher scores

indicating more frequent use of self-management practices. Scoring < 50% = ''low'', (50≤75%) = ''medium'', > 75% = ''high'' users of self- management practices.
3. **Quality Of Life in Epilepsy Inventory - QOLIE-31 (Version 1)**

Developed to assess health-related **QOL** for patients with epilepsy. It contains seven multi-item scales that include: Energy/fatigue scale: 4 sub items (2, 6, 8, and 10) used to assess patient's energy and tiredness. Emotional well-being: 5 sub items (3, 4, 5, 7, and 9) used to assess patient's feelings. Cognitive functioning: 6 sub items used to assess problem solving abilities (12), memory problems (15, 16, 26), concentration on reading (17) and concentration on doing a thing at a time (18). social functioning: 5 sub items used to assess social limitations (13, 28), leisure time activities (19), driving and transportations (20), and work limitations (27), medication effects: 3 sub items used to assess physical effects of antiepileptic medications (29), mental effects of antiepileptic medications (30), and worry about taking antiepileptic medications for a long time (24), seizure worry: 5 sub items (11, 21, 22, 23, and 25) used to assess seizure worry, overall QOL: 2 sub items (item number 1 and 14) cover: Rating patients' QOL now using a scale ranged from the best possible QOL (10) to the worst possible QOL (zero), rating patients' QOL during the past 4 weeks using a scale that was divided into five categories as very well: could hardly be better (10 which represent 100%), pretty good 8 (75 to less than 100%), good and bad parts about equal 6 (50 to less than 75%), pretty bad 4 (50 to less than 25%), and very bad 2 (0 to 25%).

Internal consistency, reliability coefficients of QOLIE-31 tool using Cronbach's alpha ranged from α = 0.77 (social functioning scale) to α = 0s.85 (cognitive functioning scale). Test-retest data demonstrated good reliability (range r =0.64-0.85).

The scoring procedure for the QOlIE 31 converted the raw pre-coded numeric values of items to obtain 0-100 total score. Scores were obtained by dividing the sum of the valid item scores by the number of items with valid responses in each scale. The higher score denoting a better QOL, finally measured on 0-100 scale as: Quality of life < 33.3 = a worse QOL, from 33.3 to ≤ 66.6% = moderate quality of life, > than 66.6 =better QOL.
Method
Assessment phase (for both groups): It was carried out using the three tools to collect baseline data and to identify patients' needs for health education. The data were collected from the control group before those of the study group to prevent knowledge contamination.
Planning phase: Included goals, contents, priorities and expected outcomes, according to patients' individual needs and problems. Illustrative educational booklet in a simple Arabic language with simple pictures also was developed.
Implementation phase: The participants in the study group were divided into ten groups. Each group was including 3-5 patients. Each receiving 4 educational sessions scheduled as 1 session per week for one month duration. Each session was taking approximately 45-60 minutes.
The educational content was delivered in group sessions through face-to-face lectures. The content was presented using power point slides, and histories of patients facing the challenges of epilepsy as the famous and talented people in the history suffered from epilepsy. The third session included self-management practices in: physical activity and exercise, smoking cessation, alcoholism and addiction, stress, information and memory and concentration problems management. The fourth session allocated for reinforcement and answering of patients' questions.
Evaluation phase: Both groups were evaluated to determine the impact of implementing the health education program to the study group on health-related knowledge, self-management practices and **QOL** in comparison with the control group. Conducted after one month post implementation of health education program using tools I&II&III, and then after three months using the same tools.
Statistical analysis

Statistical analysis was done by SPSS v20. Quantitative variables were presented as mean and standard deviation (SD) and were compared by paired Student's t-test. Qualitative variables were presented as frequency and percentage (%) and were compared by the Chi-square test, Monte Carlo test, and Fisher's exact test. The ANOVA test was used to compare two or more independent groups (F Test), The Friedman test was used as a non-parametric test alternative to the one-way ANOVA with repeated measures. A two-tailed P value < 0.05 was considered significant.

RESULTS

Table (1): This table shows that there was no significant difference between patients in the study and control groups regarding sociodemographic characteristics. (*P* >0.05). Regarding patients' age, the results revealed that the highest percentage of patients in both study and control groups (45%, 37.5%, respectively) were between 20 < 30 years of age. In relation to patients' gender, half of patients in the study group were males and the other half were females, while slightly more than half of patients in the control group (52.5%) were male. As regards the marital status, the highest percentage of patients in both the study and control groups (57.5 % and 52.5%, respectively), were married. Regarding the educational level, the lowest percentage in both the study and control groups (7.5% and 9%, respectively) had university education.

Table (2): Reciprocally study and control groups display similar clinical characteristics with no significant differences through different items. Nearly equal distribution, with 42.5% (study) and 40% (control) starting epilepsy before age 10. Fewer in the study group reported a family history of epilepsy (22.5%) vs. (32.5%) in control. Mostly generalized seizures in both groups (80% vs. 75%). Higher monotherapy in the study group (45% vs. 32.5% control). Comparable rates of aura experienced by 40% study vs. 35% in control.

Table (3): Displays patient's knowledge mean percent score; it was found that there were no statistically significant differences between the two groups before implementation of the program (P=0.075). While highly statistically significant differences were detected between study and control groups after 1 month and 3 months post implementation of the health education program (P<0.001).

Table (4): Shows no statistically significant differences between the study and control groups before implementation of the program (p=0.182). However, highly statistically significant differences were detected between both groups after one- and three-months post program implementation (p<0.001). Moreover, the mean percent score of total self-management practices before implementation of the program for both groups were low (34.27±9.01, 33.22±6.18 respectively), indicating **low use of self-management practices**. However, the mean percent score increased immediately after one month post program implementation for the study group (91.02±2.13), indicating **high use of self- management practices**.

Table (5): reveals that, as regards the study group there was a highly statistically significant positive correlation between the mean percent score of epilepsy self-management and QOLIE overall score at one month post and at three months after the health education program (p= 0.002*, p=0.001* respectively). On the other hand, as regards the control group there was no correlation

between mean %score of epilepsy self-management and QOLIE overall score at 1-month post and at 3 months after the health education program (p=0.159, and 0.315 respectively).

Table (6) shows no statistically significant differences between the two groups before implementation of the program (P = 0.978). While highly statistically significant differences were detected between the study and control groups after 1 month and 3 months post implementation of the health education program (P<0.001). Moreover, the mean percent subscale score of energy/fatigue health domain of QOL preprogram implementation for the study and control groups were 30.00±10.74, and 29.94±13.66 respectively, indicating worse quality of life. However, the mean percent subscale score increased after 1 month post implementing the program for the study group (62.31±10.05), indicating moderate quality of life.

Table (7) exhibits a highly statistically significant differences between both groups after one month and three months post implementation of the health education program (P<0.001). Moreover, the mean percent subscale score of the cognitive functioning domain of QOL pre-program implementation for the study and control groups was 27.06±5.22, and 26.53±5.12 respectively, indicating worse quality of life. However, it increased after one month post implementing the program for the study group (63.70±6.61), indicating moderate quality of life.

Table (8) shows no statistically significant differences between the study and control groups before implementation of the program (P =0.386). While a highly statistically significant differences were detected between both groups after one month and three months post implementation of the health education program (P<0.001). The mean percent subscale score of social functioning domain of QOL preprogram implementation for the study and control groups was 30.45±6.22, and 30.45±6.21 indicating worse quality of life. However, the mean percent subscale score increased after one month post implementing the program for the study group (63.80±8.30), indicating moderate quality of life. A decline was detected in the mean percent subscale score of social functioning domain of QOL in the study group after three months post program implementation (47.85±13.65), indicating also moderate quality of life.

Table (9) establishes a highly statistically significant positive correlation between mean percent score of knowledge and epilepsy self-management practices total score at one month and three months after the health education program. Moreover, there was a statistically significant positive correlation between mean percent knowledge and QOLIE overall score at one month and three months after the health education program. While regarding the control group, there was no correlation between mean percent score of knowledge and epilepsy self-management total score at one month and three months after the health education program. Moreover, there was no correlation between the mean percent score of knowledge and QOLIE overall score at one month and three months after the implementation of health education program.

Table (10) reveals that, as regards the study group there was a highly statistically significant "positive correlation" between the mean **percent** score of epilepsy self-management and QOLIE overall score at **one** month post and at three months after the health education program (p= 0.002*, p=0.001* respectively).

Table (1):   Socio-demographic Characteristics of Patients in the study and control groups.

Socio-demographic characteristics	Study group (n=40))		Control group (n=40)		Test of significance	
	No.	%	No.	%	Test	P value
Age in years						
20 -	18	45	15	37.5	X^2 27.843	0.484
30 -	12	30	16	40		
40 -	5	12.5	3	7.5		
50 - 60	5	12.5	6	15		
Min-Max	20-60		20-58			
Mean ± SD	33.05 ± 10.891		33.23 ± 10.307			
Gender						
Male	20	50.0	21	52.5	X^2 0.050	0.173
Female	20	50.0	19	47.5		
Marital status						
Single	15	37.5	17	42.5	FET: 0.714	0.446
Married	23	57.5	21	52.5		
Divorced	1	2.5	1	2.5		
Widow	1	2.5	1	2.5		
Level of education						
Illiterate	10	25	10	25	FET: 0.527	0.414
Read and write	13	32.5	11	28.5		
Basic education	10	25	11	26.5		
Secondary education	4	10	4	11		
University education	3	7.5	4	9		
Occupation						
Clerical work	2	5	2	5	FET: 5.022	0.314
Manual work	8	20	10	25		
Professionals	4	10	0	0.0		
Housewives	16	40	14	35		
Not working	10	25	14	35		
Monthly income from patient's point of view (adequacy of monthly income)						
Not enough	39	97.5	36	90	FET: 1.920	0.152
Enough	1	2.5	4	10		
Area of residence						
Urban	24	60	28	70	X^2 : 0.879	0.121
Rural	16	40	12	30		

n = number of studied patients   *X^2: Chi-square test*   *FET: Fisher exact test*   *P: P value of test of significance*

Table (2): Clinical characteristics of patients in the study and control groups.

Clinical characteristics	Study group (n=40)		Control group (n=40)		Test of significance	
	No.	%	No.	%	Test	P value
Age of onset of the first attack of epilepsy (years)						
1<10 years	17	42.5	16	40	FET: 1.288	0.468
10< 20 years	13	32.5	15	37.5		
20<30 years	7	17.5	7	17.5		
30<40 years	2	5	1	2.5		
40< 50 years	1	2.5	0	0.0		
50$\leq$ 60 years	0	0.0	1	2.5		
Duration of illness (by years)						
Min-Max Mean ± SD	1-42 16.18 ± 9.706		1-53 17.88 ± 9.900		FET: 23.283	0.236
Family history of epilepsy						
No	31	77.5	27	67.5	X^2 :1.003	0.121
Yes	9	22.5	13	32.5		
Type of seizure						
Partial	8	20	10	25	X^2 : 0.287	0.184
Generalized	32	80	30	75		
The prescribed medication						
Monotherapy	18	45	13	32.5	X^2 : 1.317	0.095
Poly-therapy	22	55	27	67.5		
Presence of aura						
Yes	16	40	14	35	X^2 :0.213	0.164
No	24	60	26	65		
Seizure triggers						
Noncompliance with medication	9	22.5	14	35	FET: 2.417	0.095
Insufficient sleep or interrupted sleep	5	12.5	6	15		
Stressors (psychological & physical).	17	42.5	14	35		
Menstruation (in females)	8	20	5	12.5		
Hunger	1	2.5	1	2.5		
Numbers of seizures in the last month						
None	0	0.0	1	2.5	**FET: 2.541**	0.311
Once	12	30	10	25		
Twice	14	35	10	25		
More than twice	14	35	19	47.5		
Duration of seizure (by minutes)						
Min. – Max Mean ± SD.	1 – 10 3.33 ± 1.607		1 – 10 3.65 ± 1.494		**FET: 5.322**	0.209
Seizure frequency						
Once or more/ month	34	85	29	72.5	**FET: 2.371**	0.127
Once or more/ 3 months	4	10	7	17.5		
Once or more/ 6month	1	2.5	1	2.5		
Once / year	1	2.5	3	7.5		

n = number of patients FET: Fisher exact test   P: P value of test of significance

Table (3): Comparison between the Study and Control groups Pre and Post Implementation of the Health Education Program in relation to Health-related knowledge.

Patient's knowledge items	Study group			Control			Test of significance				
							Friedman test		t-test		
	Before	After 1 month	After 3 months	Before	After 1 month	After 3 months					
	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	p_1	p_2	p_3	p_4	p_5
Meaning of epilepsy	0.43±0.81	2.00±0.00	2.00±0.00	0.40±0.81	0.40±0.81	0.45±0.84	<0.001*	<0.001*	0.884	<0.001*	<0.001*
Causes of seizure	0.33±0.47	1.70±0.46	1.65±0.48	0.10±0.30	0.10±0.30	0.10±0.30	<0.001*	<0.001*	0.011*	<0.001*	<0.001*
Seizure triggers	0.25±0.43	1.70±0.46	1.48±0.50	0.10±0.30	0.10±0.30	0.15±0.36	<0.001*	<0.001*	0.057	<0.001*	<0.001*
The symptoms that immediately precede the occurrence of seizure (Auras)	0.18±0.38	1.80±0.40	1.60±0.49	0.15±0.36	0.15±0.36	0.15±0.36	<0.001*	<0.001*	0.743	<0.001*	<0.001*
The signs and symptoms related to epilepsy	0.10±0.30	1.73±0.45	1.63±0.49	0.03±0.15	0.03±0.15	0.05±0.22	<0.001*	<0.001*	0.183	<0.001*	<0.001*
The problems and complications of epilepsy	0.08±0.26	1.63±0.49	1.58±0.50	0.05±0.22	0.08±0.26	0.05±0.22	<0.001*	<0.001*	0.570	<0.001*	<0.001*
The risks that should be avoided to prevent hazards during seizure attacks	0.08±0.26	1.85±0.36	1.48±0.50	0.03±0.15	0.03±0.15	0.03±0.15	<0.001*	<0.001*	0.323	<0.001*	<0.001*
The antiepileptic drugs side effects	0.05±0.22	1.78±.42	1.63±.49	0.03±0.15	0.03±0.15	0.03±0.15	<0.001*	<0.001*	0.323	<0.001*	<0.001*
Total score (degree = 16)	1.47±1.82	14.17±1.37	13.02±1.34	0.87±1.18	0.90±1.17	1.00±1.15	<0.001*	<0.001*	0.075	<0.001*	<0.001*
Mean % score** (degree = 100)	9.22±11.40	88.59±8.59	81.40±8.43	5.47±7.37	5.62±7.32	6.25±7.21					

p_1: Stands for p-value for Friedman test for comparison between pre with 1 month post the health education program in the study group

p_2: Stands for p-value for Friedman test for comparison between pre with 3 months post the health education program in the study group

p_3: p value for Student t-test for comparing between study and control pre the health education program

p_4: p value for Student t-test for comparing between study and control 1 month post the health education program

p_5: p value for Student t-test for comparing between study and control 3 months post the health education program

Table (4): Comparison between the study and control groups pre and post implementation of the health education program in relation to lifestyle self-management practices.

Lifestyle self-management items	Study			Control			Test of significance				
	Before	After one month	Three months later	Before	After one month	Three months later	Friedman test		t-test		
	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	p_1	p_2	p_3	p_4	p_5
Practice stress reduction techniques	1.20±.75	5.00±0.00	4.55±0.50	1.00±0.00	1.00±0.00	1.00±0.00	<0.001*	<0.001*	0.103	<0.001*	<0.001*
Get enough sleep.	2.25±1.10	4.75±0.43	4.40±0.49	1.70±0.88	1.70±0.88	1.70±0.88	<0.001*	<0.001*	0.011*	<0.001*	<0.001*
Enjoy helping manage stress.	1.55±0.93	4.05±0.81	3.90±0.70	1.20±0.46	1.20±0.46	1.20±0.46	<0.001*	<0.001*	0.021*	<0.001*	<0.001*
Maintain personal hygiene	1.25±0.77	4.65±0.48	4.15±0.58	1.20±0.40	1.20±0.40	1.20±0.40	<0.001*	<0.001*	0.700	<0.001*	<0.001*
Get enough exercise	1.20±0.60	4.20±0.60	3.95±0.38	1.15±0.53	1.15±0.53	1.15±0.53	<0.001*	<0.001*	0.711	<0.001*	<0.001*
Eat regular meals.	2.28±1.10	4.35±0.70	3.83±0.63	2.23±0.73	2.23±0.73	2.23±0.73	<0.001*	<0.001*	0.767	<0.001*	<0.001*
Total subscale score (degree = 30)	9.72±3.53	27.00±1.46	24.77±1.38	8.47±1.73	8.47±1.73	8.47±1.73	<0.001*	0.077	0.025*	<0.001*	<0.001*
Mean % subscale score ** (degree = 100)	32.41±11.79	90.00±4.89	82.58±4.62	28.25±5.79	28.25±5.79	28.25±5.79					

Table (5): Comparison between the Study and Control groups Pre- and Post-implementation of the Health Education Program in relation to Seizure Management Practices

Seizure self-management items	Study			Control			Test of significance				
	Before	Immediately after	Two months later	Before	Immediately after	Two months later	Friedman test		t-test		
	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	p1	p2	p3	p4	p5
Stay out of situations that might cause a seizure	1.78±0.94	4.15±0.58	3.98±0.35	1.33±0.73	1.33±0.73	1.33±0.73	<0.001*	<0.001*	0.018*	<0.001*	<0.001*
Take my seizure medication when going away from home.	2.15±0.92	4.33±0.94	4.20±0.91	1.73±0.87	1.73±0.87	1.73±0.87	<0.001*	<0.001*	0.020*	<0.001*	<0.001*
Call my doctor if I have more seizures than usual.	1.75±1.10	4.38±0.66	4.00±0.81	1.43±0.74	1.43±0.74	1.43±0.74	<0.001*	<0.001*	0.068	<0.001*	<0.001*
Remind myself to take my seizure medication	1.35±0.86	4.90±0.30	4.48±0.60	1.20±0.60	1.20±0.60	1.20±0.60	<0.001*	<0.001*	0.361	<0.001*	<0.001*
Do blood tests as the doctor orders.	1.98±0.94	5.00±0.00	4.28±0.81	2.10±0.49	2.10±0.49	2.10±0.49	<0.001*	<0.001*	0.463	<0.001*	<0.001*
Stay away from environmental factors that precipitate seizures	1.85±1.07	4.95±0.22	4.58±0.50	1.50±0.98	1.50±0.98	1.50±0.98	<0.001*	<0.001*	0.090	<0.001*	<0.001*
Total subscale score (degree = 30)	10.85±4.16	27.70±1.45	25.50±1.75	9.27±2.73	9.27±2.73	9.27±2.73	<0.001*	<0.001*	0.035*	<0.001*	<0.001*
Mean % subscale score (degree = 100)	36.16±13.89	92.33±4.84	85.00±5.84	30.91±9.12	30.91±9.12	30.91±9.12					

Table (6): Comparison between the Study and Control Groups Pre and Post Implementation of the Health Education Program in Relation to Energy/Fatigue Health Domain of QOL.

Energy/fatigue	Study			Control			Test of significance				
	Before	After one month	Three months later	Before	After one month	Three months later	Friedman test		t-test		
	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	p_1	p_2	p_3	p_4	p_5
Feel full of pep	29.50±20.25	60.00±15.02	58.75±14.70	29.00±22.62	30.00±22.65	29.00±22.62	<0.001*	<0.001*	.905	<0.001*	<0.001*
Have a lot of energy	33.50±19.94	64.75±16.64	59.25±14.74	35.75±28.18	35.75±28.18	35.75±28.183	<0.001*	<0.001*	.630	<0.001*	<0.001*
Feel worn out	30.50±18.67	63.00±18.42	55.50±16.32	29.50±12.80	29.50±12.80	30.00±12.810	<0.001*	<0.001*	.789	<0.001*	<0.001*
Feel tired	26.50±10.51	61.50±22.82	58.75±22.66	25.50±9.04	25.50±9.04	25.50±9.044	<0.001*	<0.001*	.623	<0.001*	<0.001*
Mean % Subscale Final Score (degree =100)	30.00±10.74	62.31±10.05	58.06±9.9	29.94±13.66	30.19±13.69	30.06±13.60	<0.001*	<0.001*	.978	<0.001*	<0.001*

p_1: Stands for p-value for Friedman test for comparison between pre with 1 month post the health education program in the study group

p_2: Stands for p-value for Friedman test for comparison between pre with 3 months post the health education program in the study group

p_3: p value for Student t-test for comparing between study and control pre the health education program

p_4: p value for Student t-test for comparing between study and control 1 month post the health education program

p_5: p value for Student t-test for comparing between study and control 3 months post the health education program

#: Reversed statement

*: Statistically significant at p ≤ 0.05

Quality of life less than 33.3 will be considered as a worse quality of life.

Quality of life from 33.3 to ≤ 66.6% will be considered as a moderate quality of life

Quality of life more than 66.6 will be considered as better quality of life.

Table (7): Comparison between the Study and Control Groups Pre and Post Implementation of the Health Education Program in relation to the Cognitive Functions Domain of QOL.

Cognitive functions	Study			Control			Test of significance				
	Before	After one month	Three months later	Before	After one month	Three months later	Friedman test		t-test		
	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	p_1	p_2	p_3	p_4	p_5
Reasoning and solving problems	26.00±12.15	63.50±11.89	61.75±19.46	24.50±8.46	24.50±8.46	24.50±8.46	<0.001*	<0.001*	.520	<0.001*	<0.001*
Trouble with your memory	34.75±7.42	64.25±11.29	64.20±6.042	35.56±9.01	35.56±9.01	35.23±9.33	<0.001*	<0.001*	.671	<0.001*	<0.001*
Trouble remembering things	24.00±9.28	64.25±11.74	25.00±17.39	22.50±8.09	22.50±8.09	22.50±8.09	<0.001*	<0.001*	.474	<0.001*	.442
Trouble concentrating on reading (n=30)	26.50±15.28	64.33±24.73	53.00±9.15	25.00±8.77	25.00±8.77	25.00±8.77	<0.001*	<0.001*	.618	<0.001*	<0.001*
Trouble concentrating on doing one thing at a time	25.50±11.08	61.00±11.04	67.50±24.26	26.00±14.46	26.00±14.46	25.50±13.58	<0.001*	<0.001*	.850	<0.001*	<0.001*
Memory difficulties	25.63±3.95	64.38±26.49	53.13±18.94	25.63±3.95	25.63±3.95	25.63±3.95	<0.001*	<0.001*	1.000	<0.001*	<0.001*
Mean % Subscale Final Score (degree =100)	27.06±5.22	63.70±6.61	54.59±5.72	26.53±5.12	26.53±5.12	26.39±5.11	<0.001*	<0.001*	.648	<0.001*	<0.001*

Table (8): Comparison between the Study and Control Groups pre and Post Implementation of the Health Education Program in relation to Social Functioning Domain of QOL.

Social functioning domain of QOL	Study			Control			Test of significance				
	Before	After one month	Three months later	Before	After one month	Three months later	Friedman test		t-test		
	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	Mean± SD	p_1	p_2	p_3	p_4	p_5
Social activities	28.50±14.24	68.25±20.37	50.00±20.13	26.00±16.45	26.00±16.455	26.25±16.438	<0.001*	<0.001*	.405	<0.001*	<0.001*
Leisure time	28.75±9.04	65.00±12.43	51.63±15.64	28.75±12.60	28.75±12.60	28.75±12.60	<0.001*	<0.001*	1.000	<0.001*	<0.001*
Driving and transportations	30.63±10.57	63.25±14.96	47.63±24.57	29.25±11.24	29.25±11.240	29.25±11.24	<0.001*	<0.001*	.584	<0.001*	<0.001*
Work limitations	31.88±12.64	60.63±19.51	43.37±28.59	30.50±12.08	30.50±12.079	30.38±12.16	<0.001*	<0.001*	.589	<0.001*	<0.001*
Social limitations	32.50±15.19	61.88±18.97	46.62±34.07	32.50±11.60	32.50±11.602	33.13±11.86	<0.001*	<0.001*	1.000	<0.001*	<0.001*
Mean percent Subscale Final Score** (degree =100)	30.45±6.22	63.80±8.30	47.85±13.65	30.45±6.21	29.40±6.93	29.55±6.97	<0.001*	<0.001*	.386	<0.001*	<0.001*

Table (9): Correlation between Knowledge of the Study and Control Groups and their Self-management Practices and QOLIE Overall Score Pre and Post Implementation of the Health Education Program.

Variables	Mean Percent Score of Knowledge											
	Study						Control					
	Before		After one month		Three months later		Before		After one month		Three months later	
	F	P	F	P	F	P	F	P	F	P	F	P
Epilepsy Self-management practices total Score	2.208	0.076	9.333	<0.001*	2.210	0.001*	2.245	0.084	2.415	0.067	1.734	0.165
QOLIE Overall Score	1.744	0.142	3.494	0.05*	2.225	0.015*	1.216	0.342	1.059	0.391	0.529	0.715

F: ANOVA test   *: Statistically significant at $p \leq 0.05$

Table (10): Correlation between Self-management Practices of the Study and Control Groups and their QOLIE overall Score pre and Post Implementation of the Health Education Program.

Variables	Mean percent score of epilepsy self-management											
	Study						Control					
	Before		After one month		Three months later		Before		After one month		Three months later	
	F	P	F	P	F	P	F	P	F	P	F	P
QOLIE Overall Score	0.685	0.772	26.644	0.002*	6.181	<0.001*	0.685	0.772	2.839	0.159	1.748	0.315

F: ANOVA test   *: Statistically significant at p ≤ 0.05

Discussion

The current study revealed that the mean percent score of patient's knowledge related to epilepsy increased after implementation of the education program for the study group. This finding was in line with Kiyak et al **(Kiyak and Dayapoglu, 2017)** study findings which revealed that greater knowledge score was found among the participants who obtained the information about epilepsy from healthcare personnel. The result of the present study is also in harmony with Ibinda et al. **(Ibinda et al., 2014)**, and Lua et al. **(Lua and Neni, 2011)** who suggested that epilepsy treatment should focus on enhancing knowledge about the disease in order to improve health outcomes through sustained health education.

The current study found low use of information self-management practices for the study group before implementing the program also, low mean score of social support and socialization with families and friends among the studied patients before the program, which is crucial item in the information self-management domain. This finding was consistent with the finding of Bautista **(Bautista, 2017)** who revealed lower social support score and stated that PWE who have strong social support report less debilitation due to their epilepsy compared to those with poor or no social support as well as an increased sense of control over their lives, enabling them to have better coping mechanisms for handling seizures.

In the current study significant differences were detected between study and control groups post implementation of the health education program in relation to information self-management. This finding matched with the finding of a study done by Aliasghar pour **(Aliasgharpour et al., 2013)** who reported significant differences between study and control groups before the intervention and 1 month post-intervention regarding information self-management.

The current study found low practice of lifestyle self-management before the program. Stress was the first dimension in the lifestyle management also, most patients in both groups did not get enough sleep before the program. These results are in line with a study **(Novakova et al., 2013)** who found that stress is one of the most frequently self-identified seizure triggers in patients with epilepsy also, in agreement with Grigg-Damberger **(Grigg-Damberger and Foldvary-Schaefer, 2015)** who reported that epilepsy and sleep have a close association and a two way interaction.

Furthermore, the current study found significant differences between the study and control group post implementation of the health education program in relation to lifestyle self-management also, patients in both groups had low medication self-management practices, before implementation of the program. This finding was matched with Dilorio et al. **(DiIorio et al., 2011)** who found

significant improvement among studied patients with epilepsy who received three interactive modules of online self-management program addressing stress, and sleep management also, matched with Getnet et al. **(Getnet et al., 2016)** who found high prevalence of AEDs nonadherence and relate the cause to being on treatment for 6 years and above, payment for AEDs, lack of health information, poor social support, perceived stigma, and experience side effect.

Moreover, the current study found that the mean percentage subscale score of medication self-management practices significantly increased after implementation of the program also, indicated a lack of using safety self-management practices before implementing the program. This result is consistent with Dash et al. **(Dash et al., 2015)** who proved the efficacy of a structured educational program in improving drug adherence in a cohort of PWE with a low educational background, and in agreement with Peterson et al. **(Peterson et al., 2017)** who found that PWE had poor knowledge about safety precautions.

The current study revealed that the mean percentage subscale score of safety self-management significantly increased after implementation of the program among the study subjects and a low practice of seizure self-management, which is mostly pertaining to seizure control practices. These results are in line with the study done by Cole et al **(Cole and Gaspar, 2015)**, who recommended that educating patients with epilepsy about positive self-management behaviors may lead to better health outcomes and prevent complications.

Regarding the self-management total score of the current study concluded that there were no significant differences between both groups before implementation of the program. While, post implementation of the program, there were highly significant differences. These results are consistent with a study done by Cole et al **(Cole and Gaspar, 2015)** who concluded that self-management behaviors scores increased from pre implementation to post implementation of the self-management protocol. On the contrary, the current study findings are not congruent with Dilorio et al. **(DiIorio et al., 2009)** and Pramuka et al. **(Pramuka et al., 2007)**, who showed that their educational guidelines about epilepsy did not lead to improvement in their intervention group.

The current study found worse level of energy/fatigue among the studied patients in both groups before the program and detected significant improvement in the study group post implementation of the health education program regarding level of energy/fatigue. These results are in agreement with Yan et al **(Yan et al., 2016)**, Kwon et al **(Kwon et al., 2017)** who reported that the degree of fatigue was higher in adult patients with epilepsy than in healthy adults; depression and sleep-related problems were closely

correlated with fatigue among PWE; and fatigue is associated with significant impairment in QOL in epilepsy, also in line with Neves et al **(Neves and Gomes Mda, 2013)** who stated that therapeutic interventions relating to fatigue, psychiatric comorbidities and sleep appear to provide a major breakthrough in treatments for patients with epilepsy.

The current study detected worse level of emotional well-being among the studied patients in both groups before the program. This finding is somewhat close to the results of Viteva **(Viteva, 2013)** who stated that the limited or lacking employment has a negative impact on emotional well-being of PWE. In addition, the emotional well-being domain of QOL improved significantly in the study group post implementation of the health education program which was in line with Tang et al **(Tang et al., 2014)** who stated that most psych behavioral therapies are effective in improving psychological well-being for PWE.

The current study portrayed a worse level of cognitive functioning among the studied patients in both groups before the program also, detected a significant improvement in the study group post implementation of the health education program in relation to cognitive functioning domain of QOL. Similar results mentioned by Radford et al. **(Radford et al., 2012)** who indicated that patients with epilepsy can show improvements in memory after a relatively a group-based training program.

The current study found a worse level of social functioning among the studied patients before the program with significant improvement in the study group post implementation of the health education program in relation to social functioning domain of QOL it was supported by Szemere et al. **(Szemere and Jokeit, 2015)** who concluded that interventions that address social competence and functioning lead to significant improvement of social abilities among adult patients with epilepsy.

The current study found a worse level of medication effects domain among the studied patients before the program. Moreover, an improvement was detected in the study group post implementation of the program in relation to effect of medication but less than other domains of QOL. The current study found reduced QOL in the dimension of seizure worry among the studied patients before the program also, decreased seizure worries in the study group post implementation of the program. This result was like the study by Alonso-Vanegas et al. **(Alonso-Vanegas et al., 2013)** who reported reduced QOL in the dimensions of seizure worry, social function, emotional wellbeing and cognition. Finally, the overall score of QOL and its dimensions in the study group improved significantly after the program. This finding was in agreement with Helde et al. **(Helde et al., 2003)** who reported a significant difference between the total QOL before the group education program and that after one day of training and two years of consultation and follow-up by a nurse in the study group, while no significant change was observed in the control group. The current study finding revealed that there was a high significant positive correlation between mean %score of knowledge and epilepsy self-management practices total score and QOL overall score also, between mean %score of epilepsy self-management and QOLIE overall score at 1 month post and at 3 months after the health education program. This result is in line with Artinian et al. **(Artinian et al., 2002)** who indicated that knowledge deficit about

self-care was related to inability to do self-care, and the knowledge is necessary for self-care.

Recommendations

We recommend that further research to be done to determine awareness, knowledge and attitudes of nurses towards patients with epilepsy also needed to be conducted for larger number of samples, as well as long period of study time to confirm the results of the current study. It is essential to increase the level of awareness among public, patients and health care providers regarding the epilepsy and its management practices through mass media to reduce the discrimination and social stigma that surround epilepsy.

Conclusion

Adult patients with epilepsy who receive health education exhibit higher knowledge, self-management practices and QOL mean scores than those who do not receive.

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